

■ PRODUCT CHARACTERISTICS

VDSS	30V
$R_{DS(on)max}@V_{GS}=10V$	11.5mΩ
$R_{DS(on)max}@V_{GS}=4.5V$	16.5mΩ
ID	10A

■ FEATURE

- 30V/10A
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

■ APPLICATIONS

- Motor Control.
- High Current, High Speed Switching.
- Portable equipment application.

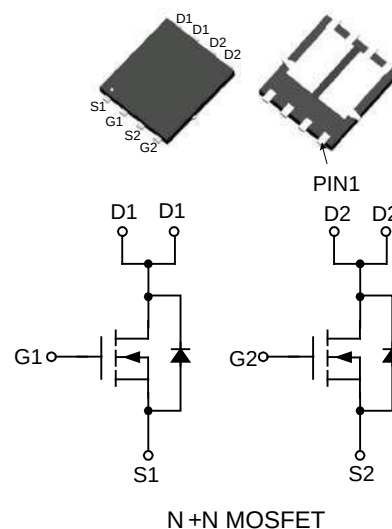
■ ORDER INFORMATION

Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT3210J	PDFN3X3	5000 pieces /Reel

■ ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	30	V
Gate-Source Voltage	V_{GSS}	± 20	V
Maximum Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 to 150	$^\circ\text{C}$
Diode Continuous Forward Current	I_S	10	A
Continuous Drain Current	I_D	10	A
Pulsed Drain Current	I_{DM}	40	A
Maximum Power Dissipation	$T_C=25^\circ\text{C}$	P_D 21	W
	$T_C=100^\circ\text{C}$	8.3	W
Avalanche Current, Single pulse	I_{AS}	19	A
Avalanche Energy, Single pulse	E_{AS}	18	mJ
Thermal Resistance-Junction to Ambient	$R_{\theta JA}$	55	$^\circ\text{C/W}$
Thermal Resistance-Junction to Case	$R_{\theta JC}$	6	$^\circ\text{C/W}$

Pin description

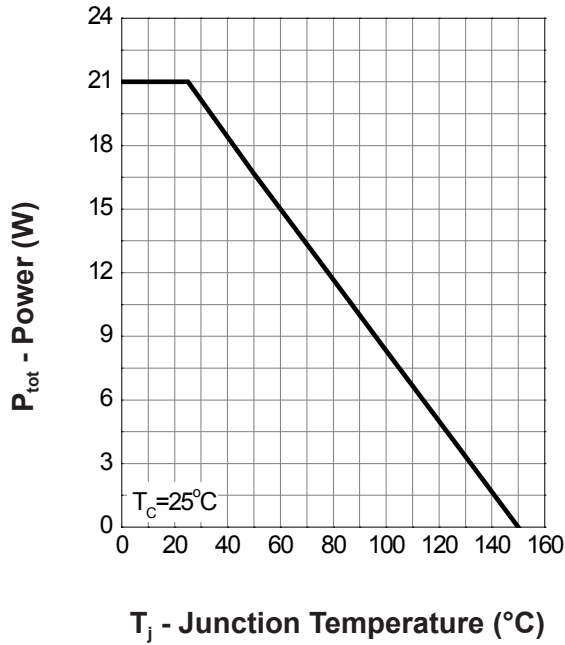


■ ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

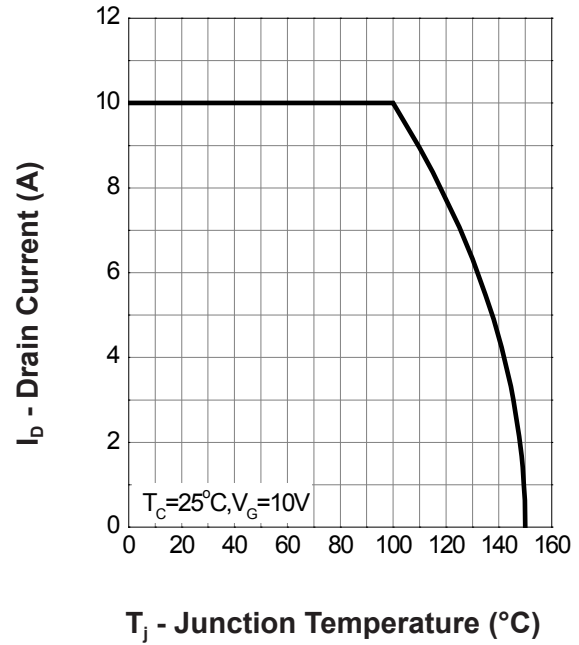
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Static characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_{DS}=250\mu A$	30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=24V, V_{GS}=0V$	-	-	1	μA
		$T_J=85^{\circ}C$	-	-	30	μA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	1.3	1.8	2.5	V
Gate Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Drain-Source On-state Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_{DS}=8A$	-	9	11.5	$m\Omega$
		$T_J=125^{\circ}C$	-	16	-	$m\Omega$
		$V_{GS}=4.5V, I_{DS}=7A$	-	12	16.5	$m\Omega$
Forward Transconductance	Gfs	$V_{DS}=5V, I_{DS}=8A$	-	12.5	-	S
Diode characteristics						
Diode Forward Voltage	V_{SD}	$I_{SD}=8A, V_{GS}=0V$	-	0.82	1.2	V
Reverse Recovery Time	t_{rr}	$I_{SD}=8A, dI_{SD}/dt=100A/\mu s$	-	11.8	-	ns
Charge Time	t_a		-	7	-	ns
Discharge Time	t_b		-	5.5	-	ns
Reverse Recovery Charge	Q_{rr}		-	5	-	nC
Dynamic characteristics						
Gate Resistance	R_G	$V_{GS}=0V, V_{DS}=0V, F=1MHz$	-	2.1	-	Ω
Input Capacitance	C_{iss}	$V_{GS}=0V,$ $V_{DS}=15V,$ Frequency=1.0MHz	-	833	-	pF
Output Capacitance	C_{oss}		-	130	-	pF
Reverse Transfer Capacitance	C_{rss}		-	73	-	pF
Turn-on Delay Time	$t_{d(ON)}$	$V_{DD}=15V, R_L=15\Omega,$ $I_{DS}=1A, V_{GEN}=10V,$ $R_G=6\Omega$	-	8	-	ns
Turn-on Rise Time	t_r		-	9.4	-	ns
Turn-off Delay Time	$t_{d(OFF)}$		-	23.4	-	ns
Turn-off Fall Time	t_f		-	5.2	-	ns
Gate charge characteristics						
Total Gate Charge	Q_g	$V_{DS}=15V, V_{GS}=10V, I_{DS}=8A$	-	15.3	-	nC
Total Gate Charge	Q_g	$V_{DS}=15V, V_{GS}=4.5V,$ $I_{DS}=8A$	-	7	-	nC
Threshold Gate Charge	Q_{gth}		-	1.5	-	nC
Gate-Source Charge	Q_{gs}		-	2.9	-	nC
Gate-Drain Charge	Q_{gd}		-	2.4	-	nC

■ TYPICAL OPERATING CHARACTERISTICS

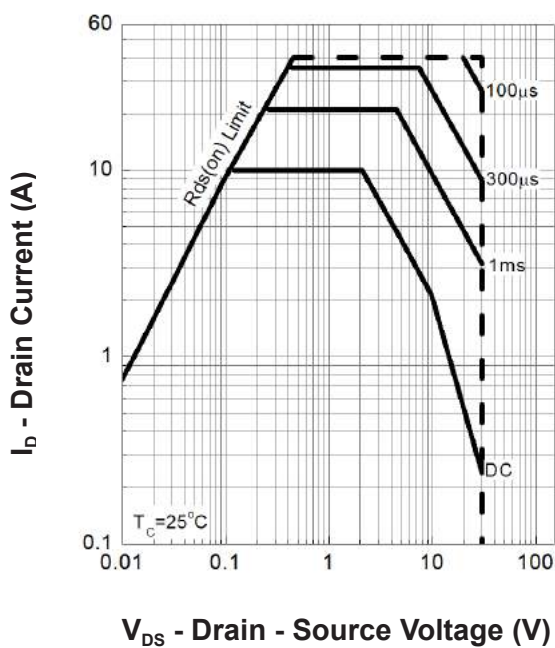
Power Dissipation



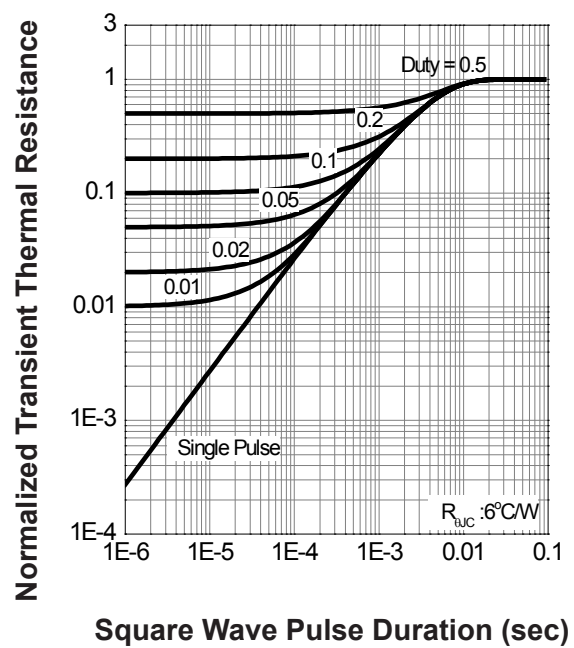
Drain Current



Safe Operation Area

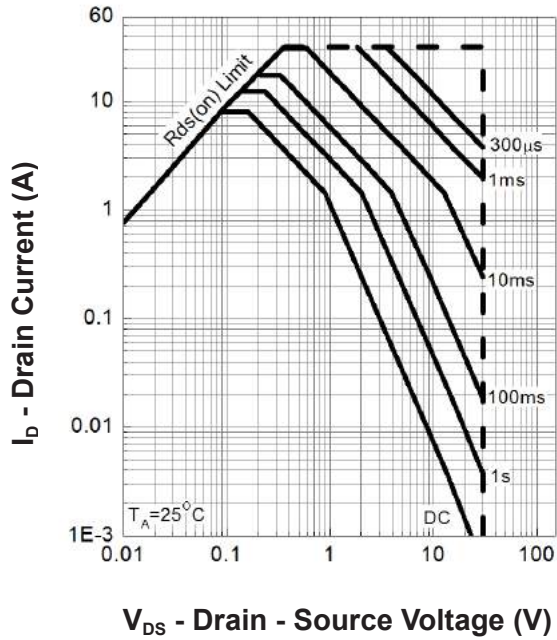


Thermal Transient Impedance

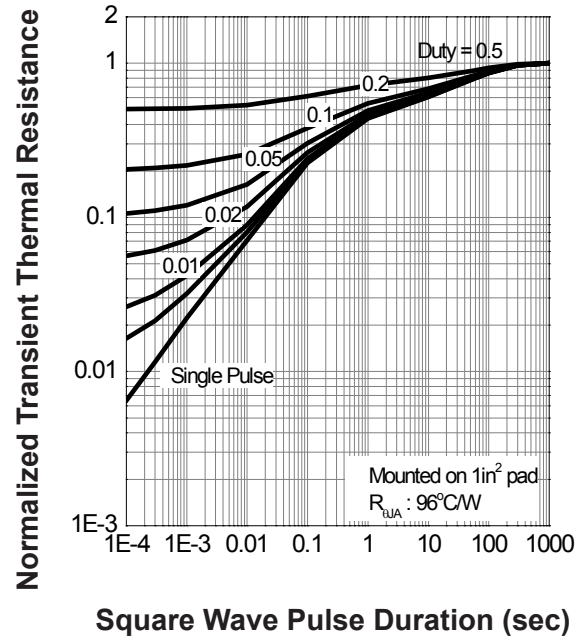


■ TYPICAL OPERATING CHARACTERISTICS(Cont.)

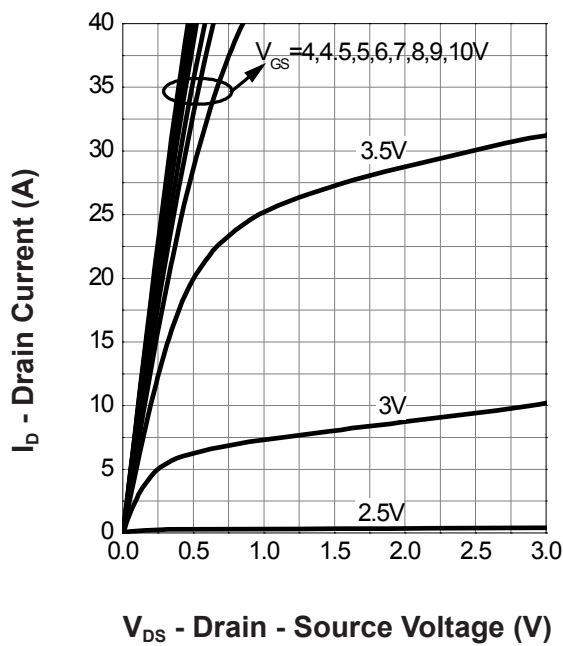
Safe Operation Area



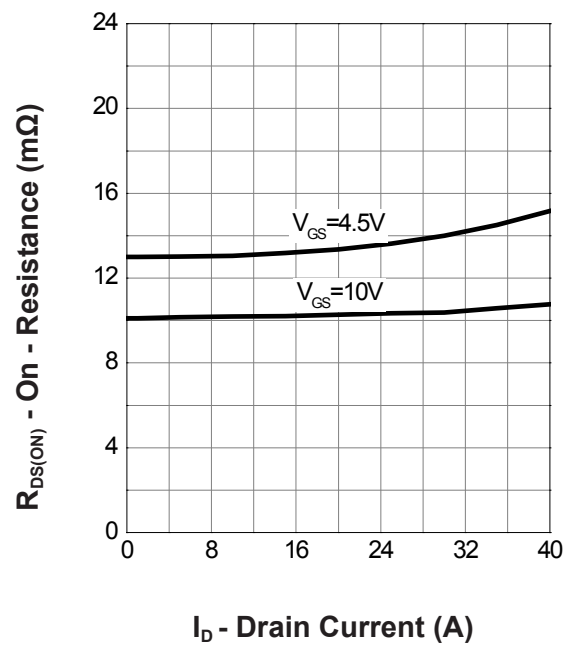
Thermal Transient Impedance



Output Characteristics

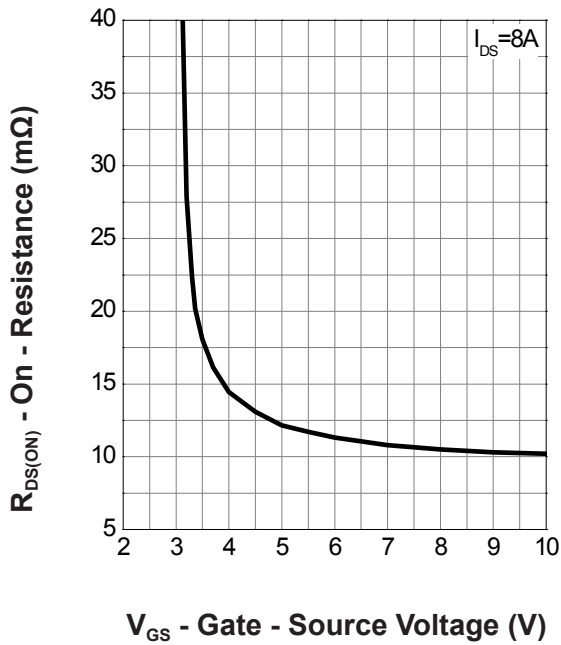


Drain-Source On Resistance

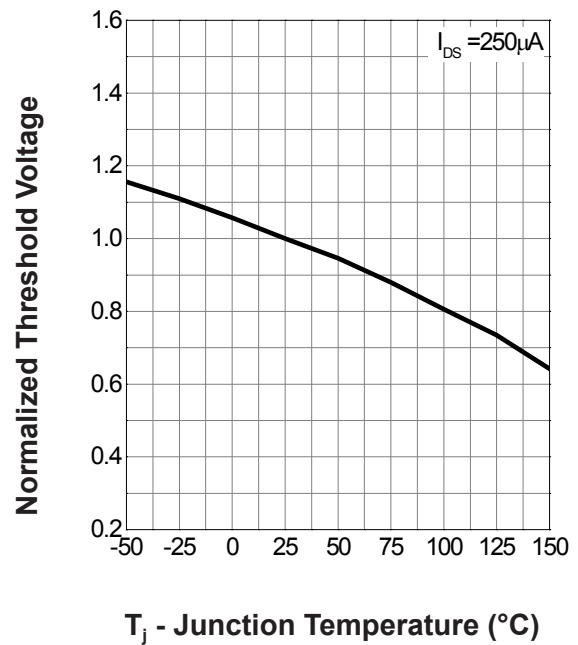


■ TYPICAL OPERATING CHARACTERISTICS(Cont.)

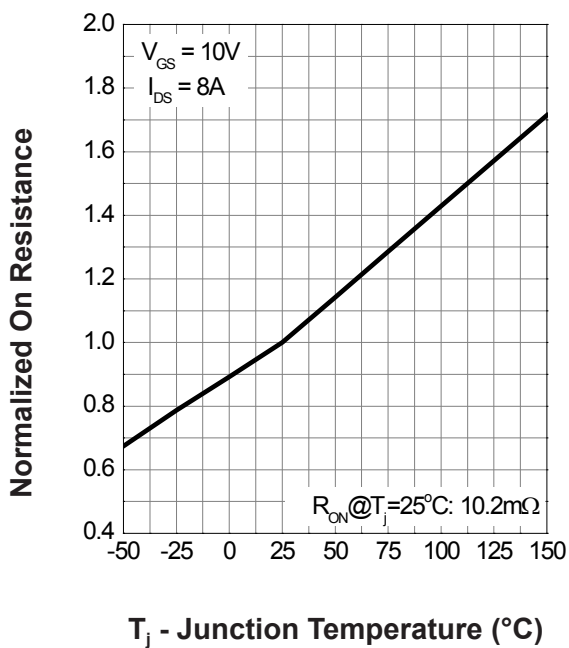
Gate-Source On Resistance



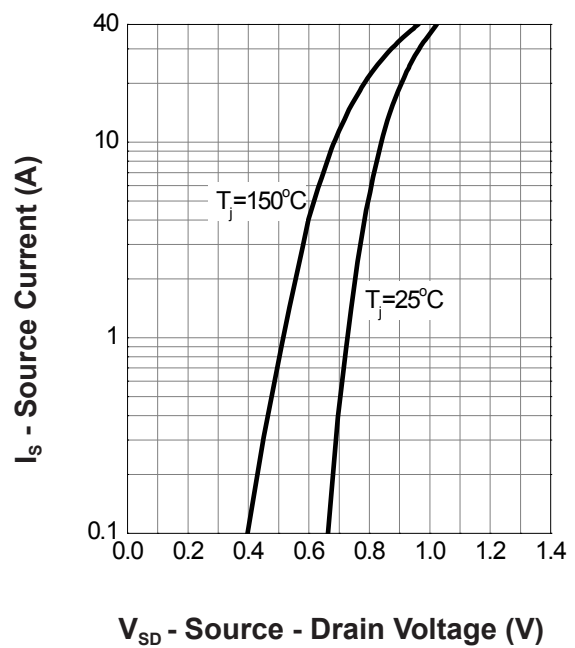
Gate Threshold Voltage



Drain-Source On Resistance

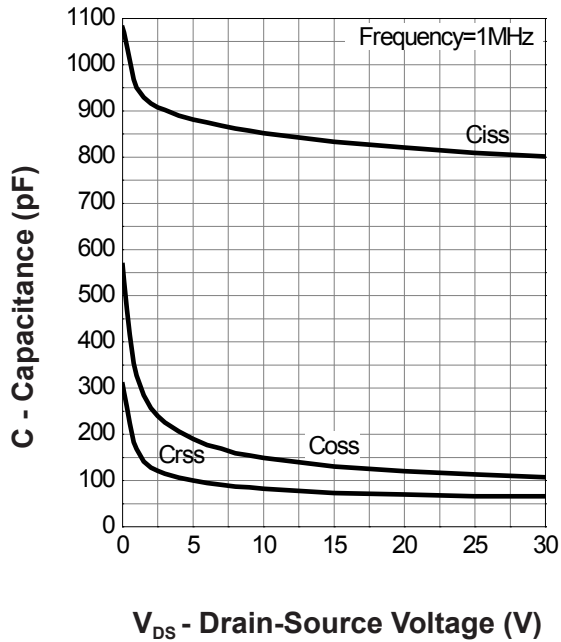


Source-Drain Diode Forward

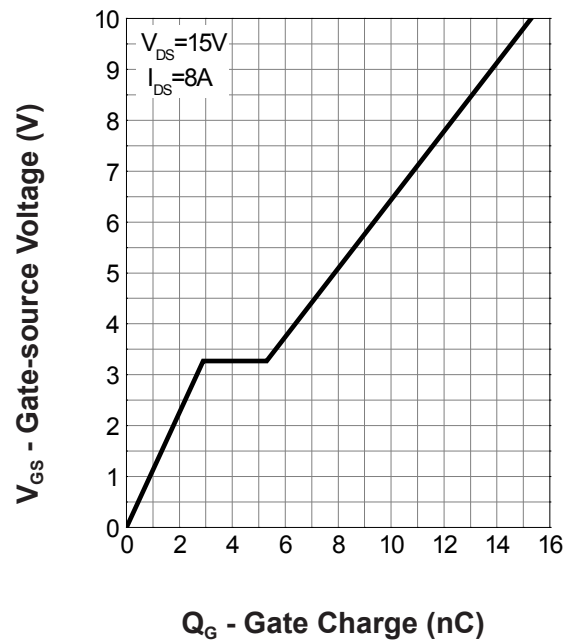


■ TYPICAL OPERATING CHARACTERISTICS(Cont.)

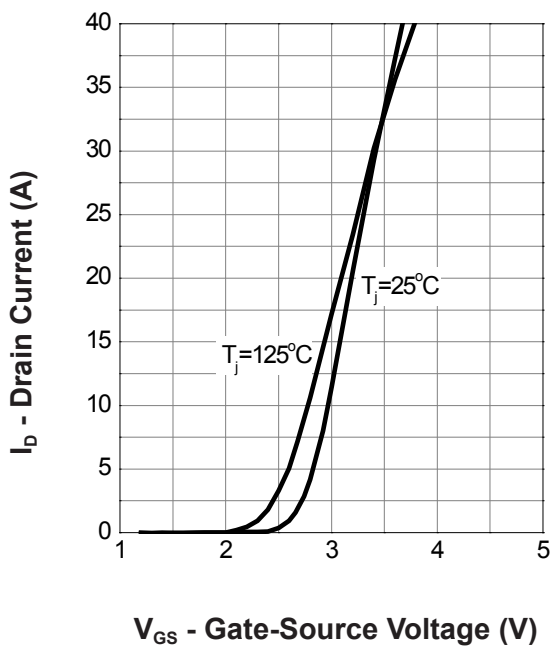
Capacitance



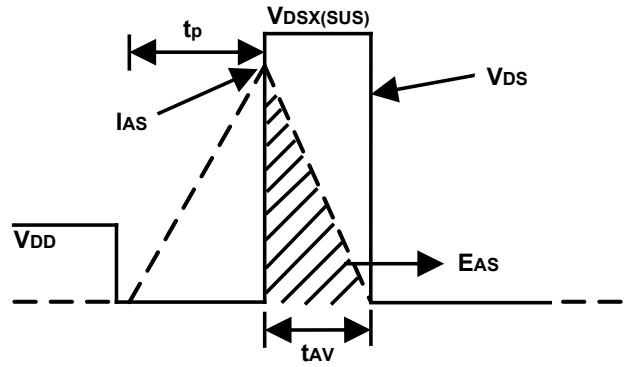
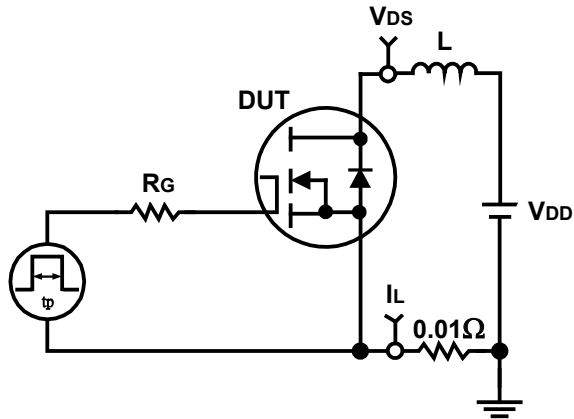
Gate Charge



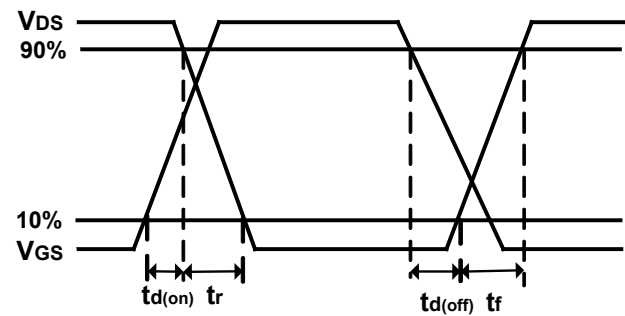
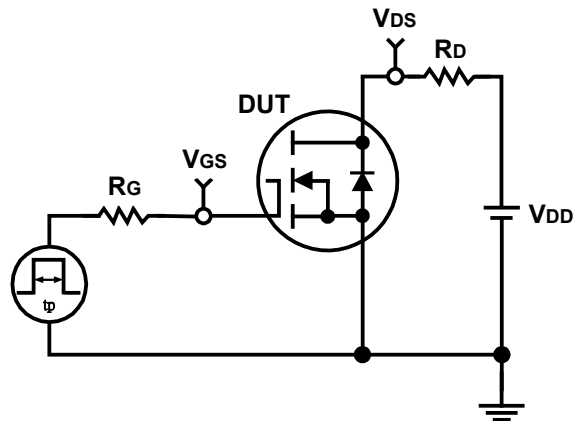
Transfer Characteristics



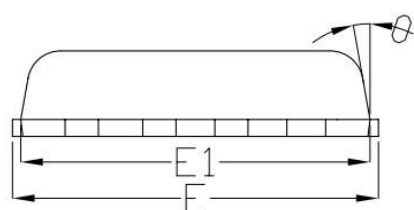
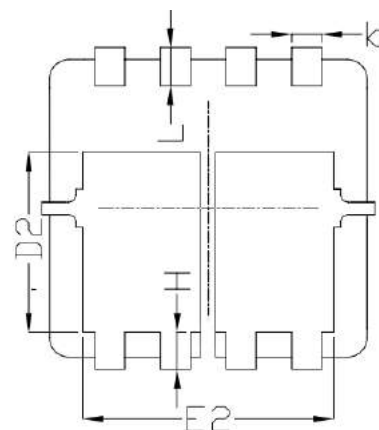
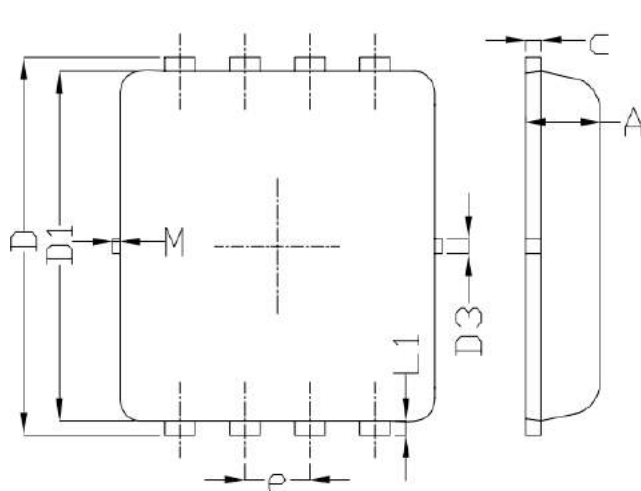
■ AVALANCHE TEST CIRCUIT AND WAVEFORMS



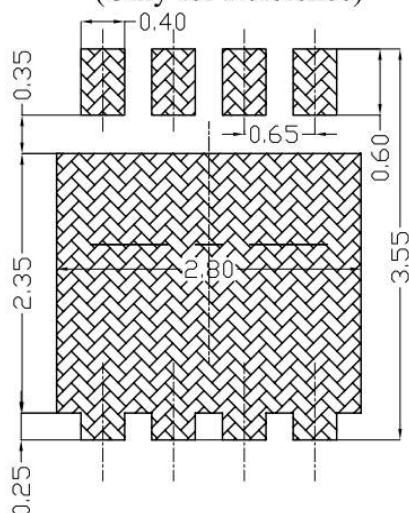
Switching Time Test Circuit and Waveforms



■ PDFN3X3-8L Package Mechanical Data



Land Pattern
(Only for Reference)



SYMBOL	DIMENSIONAL REQMTS		
	MIN	NOM	MAX
A	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.15	0.25
D	3.25	3.35	3.45
D1	3.00	3.10	3.20
D2	1.78	1.88	1.98
D3	---	0.13	---
E	3.20	3.30	3.40
E1	3.00	3.15	3.20
E2	2.39	2.49	2.59
e	0.65BSC		
H	0.30	0.39	0.50
L	0.30	0.40	0.50
L1	---	0.13	---
θ	---	10°	12°
M	*	*	0.15
* Not specified			